

762-011

HAI

Dart Aerospace Ltd.

Date: Tuesday, 06/01/2009 10:02:49 AM
User: Julie Dawson

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services Drawing Name : BK117 SKIDTUBE ASSEMBLY
Job Number : 44388A
Estimate Number : 12898
P.O. Number :
This Issue : 06/01/2009 S.O. No. :
Prsht Rev. : NC Part Number : D117762041
First Issue : // Type : SKIDTUBES Drawing Number : D3582 REVA
Previous Run : 44387A Project Number : N/A
Drawing Revision : A
Material :
Due Date : 31/01/2009 Qty: 1 Um: Each
Written By :
Checked & Approved By : JUD 09-01-06
Comment : Est Rev:A 07.06.11 New Issue EC
Est Rev:B 08-02-22 change to revA as per dwg DD verified by:EC

Additional Product

SCRAP

HAI & ONLY

P80

Job Number:



Seq. #: Machine Or Operation: Description :

1.0

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Photocopy bluefile & type labels per PPP D117-762-041 CHG001

2.0

D2962150

3.540 Outer Tube, Extrut



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number Description Batch

1 D2962-150

Extrusion

B-28 672

MB 09-01-06

3.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Determine square end of tube and deburr

2-Drill #30 pilot holes using DT8678. Do not open holes.

3- Deburr holes.

MB

09-01-06

4.0

BENDING

BENDING MACHINE - SKIDTUBES



Comment: BENDING MACHINE

Bend tube as per program

on CNC Bender and Dwg D3582. Use 5/16" locator pin on buggy "A"

MB 09-01-06

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
09.01.09	17	<p>Ø0.625 HOLE WAS DRILLED Ø0.750</p> <p>Rel. employee drilled the wrong hole size without paying attention: human error (using the wrong drill)</p> <p>used wrong drill</p>	<p>QP</p> <p>09.01.09</p> <p>PC QSI 042</p>	<p>SCRAP. MBE</p> <p>And Destroy</p> <p>no capture</p> <p>Give to H&E</p>	<p></p> <p>9-1-30</p>	<p></p> <p>9-1-30</p>	<p>QP</p> <p>09.01.09</p> <p>PC QSI 042</p>	<p>S</p> <p>09.01.09</p>

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Seq. #:

Machine Or Operation:

Description :

5.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Cut Fwd end of the tube using DT8185

2-Cut Aft end at VC using DT8185

3-Deburr ends

4-Drill Aft Cap holes using DT8678 ***DO NOT OPEN AFT CAP HOLE***

5-Locate DT 8973 & Drill Ground wire hole on top of Tube.

6-Install 3/16 cleco in Ground wire hole ,then drill all X-Bolt holes using 3/16" drill.

7-Drill pilot holes for wearplates using DT8974

8-Open wearplate holes to Ø19/64" (0.297") as per Dwg D3582.

9- open ground wear holes to 0.391" as per section B-B

10-Open Aft Cap holes using .209" drill.

11-Deburr holes.

mb 09-01-06

pm 09-01-08

6.0

D2964

Cap



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Cap

Batch: *21401 BE 09/01/08*

7.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Weld fwd cap D2964 per dwg D3582 and QSI 004

A/R AL ROD

Batch: *m/092560/m/09213 BE 09/01/08*

2-Grind flush

pm 09-01-08

W/O:		WORK ORDER CHANGES					
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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Job Number:



Seq. #:	Machine Or Operation:	Description :
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8.0	QC10	VISUAL INSPECTION OF GROUND WELDS
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Comment: VISUAL INSPECTION OF GROUND WELDS

S 09/01/08 (X)

9.0	QC5	INSPECT WORK TO CURRENT STEP
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Comment: INSPECT WORK TO CURRENT STEP

S 09/01/08 (X)

10.0	HAND FINISHING1	HAND FINISHING RESOURCE #1
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Comment: HAND FINISHING RESOURCE #1
Chemical Conversion Coat as per QSI 005 4.1

PM 09-01-08

11.0	QC3	INSPECT POWDER COAT/CHEMICAL CONVERSION
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Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

BE 09-01-09

12.0	D2971	Cross Bolt Spacer
------	-------	-------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
Cross Bolt Spacer
batch B39011

DP 9-1-20

13.0	D2973	Cross Bolt Spacer
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Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)
Cross Bolt Spacer
Batch: B14636

DP 9-1-20

14.0	D36621	Crossbolt Spacer
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Comment: Qty.: 3.0000 Each(s)/Unit Total : 3.0000 Each(s)
SPACER
batch B39022

DP 9-1-20

15.0	D36623	Crossbolt Spacer
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
SPACER
batch B337190

DP 9-1-20

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Job Number: 44388A

Part Number: D117762041

Job Number:



PHALP

Seq. #:

Machine Or Operation:

Description:

16.0

D35841

Web



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)
WEB *34422* *Amc 09-01-19*

17.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Open X-Bolt holes to .750"(4Places) as per Dwg D3582, section B-B

2-Counter Sink X-BOLT holes as per Dwg D3582

3-Deburr and blow out chips from inside of tube.

4-Bond web as per Dwg D3582 & QSI 015

A/R 241 Sike Flex Batch: *m109883*

Exp Date: *09-07-11*

5-Weld x-bolt spacers(D2973) as per Dwg D3582 section B-B.

A/R AL ROD Batch: *m110295*

6-Grind welds flush

Amc 09-01-23

pmc 09-02-19

Pto
First Pass

Tools: E

18.0

QC10

VISUAL INSPECTION OF GROUND WELDS



Comment: VISUAL INSPECTION OF GROUND WELDS

19.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

20.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

12:00
320°
12:30

M109926

BR 09-01-30

①

W/O:		WORK ORDER CHANGES					
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Job Number: 44388A

Part Number: D117762041

Job Number:



Seq. #:

Machine Or Operation:

Description :

21.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



JS



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

09-02-02

(X)

22.0

ALS41032130

Insert



Comment: Qty.: 36.0000 Each(s)/Unit Total: 36.0000 Each(s)

Insert

Batch: M105819

JS

23.0

ALS4428165

Inserts



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Inserts

batch M6989

***same as ALS7-428-165 QSI 0017 ***

JS

24.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Install Wearplate & Ground Wire inserts as per Dwg D3582.

JS

09-02-02

(X)

25.0

D2965

Cap, 105 Skidtube



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Cap

Batch: B45374

JS

26.0

D35083

Wearplate



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

WEARPLATE

Batch: B38527

JS

27.0

D35089

Wearplate



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

WEARPLATE

Batch: B40359

JS

09-02-02

(X)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Job Number: 44388A

Part Number: D117762041

Job Number:



Seq. #:	Machine Or Operation:	Description :
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28.0	D350811	Wearplate
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Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Batch: B36415

WEARPLATE

*

W

29.0	D350813	Wearplate
------	---------	-----------



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

WEARPLATE

Batch: B38528

W

30.0	D35583	Gasket
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Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

GASKET

Batch: B42253

W

31.0	D35589	Gasket
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Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

GASKET

Batch: B40361

W

32.0	D355811	Gasket
------	---------	--------



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

GASKET

Batch: B36419

W

33.0	D355813	Gasket
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Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

GASKET

Batch: B42255

W

34.0	AN3C4A	BOLT
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Comment: Qty.: 28.0000 Each(s)/Unit Total: 28.0000 Each(s)

BOLT

Batch: M110372

W

09-02-02

RD

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Job Number: 44388A

Part Number: D117762041

Job Number:



Seq. #:

Machine Or Operation:

Description :

35.0

AN3C5A

Bolt



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Bolt

Batch: M110584

91

36.0

AN44A

Bolt



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Bolt

batch M106918

91

37.0

AN960C10L

washer



Comment: Qty.: 28.0000 Each(s)/Unit Total: 28.0000 Each(s)

washer

Batch: M110139

91

38.0

AN960JD10L

Washer



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Washer

batch M109632

91

39.0

AN960JD416L

Washer



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Washer

batch M1108583

91

40.0

NAS1611012

O-RING



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

O-RING

batch: N/A

91

41.0

NAS1611015

O-RING



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

O-RING

batch: N/A

91

91 09-02-62 80

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Job Number: 44388A

Part Number: D117762041

Job Number:



Seq. #:	Machine Or Operation:	Description :
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42.0	NAS1611016	O-RING
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Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)
O-RING
batch: N/A

43.0	D3492049	Plug Assembly
------	----------	---------------



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)
PLUG ASSEMBLY
batch: B340356 N/A 09-02-02 EP

44.0	D3492051	Plug Assembly
------	----------	---------------



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)
PLUG ASSEMBLY
batch: B334723 JS

45.0	D3492053	Plug Assembly
------	----------	---------------



Comment: Qty.: 6.0000 Each(s)/Unit Total: 6.0000 Each(s)
PLUG ASSEMBLY
batch: B340353 JS

46.0	HAND FINISHING1	HAND FINISHING RESOURCE #1
------	-----------------	----------------------------



Comment: HAND FINISHING RESOURCE #1

✓ 1-Inspect for Foreign objects

✓ 2-Install Aft cap as per Dwg D3582, Detail "C"
A/R 241 Sika Flex Batch: M109833
Exp Date: 0911

2 3-Install Wearplates as per Dwg D3582,
Note: Install Bolt and washer on Ground Wire inserts on top of tube see section D-D of dwg D3582
*****Do not install bolts where indicated on Dwg (Note #6)*****
A/R 241 Sika Flex Batch: M109833
Exp Date: 0911

4-assemble o'ring as per dwg D3492 and apply o'ring lube
✓ A/R 55-o'ring lube batch: N/A

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Seq. #:

Machine Or Operation:

Description :

5- Wing Walk as per Dwg D3043 and QSI 005 4.4

M110454 JF 09-02-02 (21)

47.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

48.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D117-762-041

Location:

PPP Rev:

HAI USE ONLY
Not for stock

49.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



00574

11 09.02.03

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

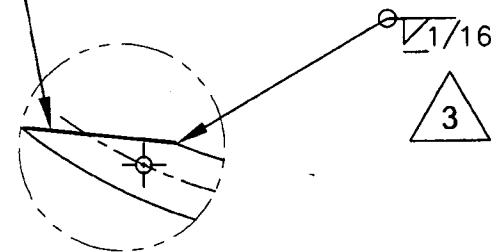
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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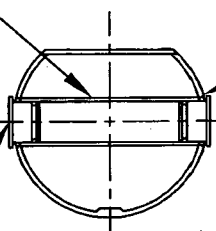
NOTE: Date & initial all entries

D2964 CAP
(GRIND FLUSH)



DETAIL C
SCALE 1:10

D2971 SPACER



AFTER FINISH
INSTALL,
D3492-049
PLUG ASSEMBLY
(2 PLACES)

SECTION D-D
SCALE 3:10

AFTER FINISH
INSTALL,
D3492-051
PLUG ASSEMBLY
(2 PLACES)

SECTION E-E
SCALE 3:10

SECTION D-D NOTES

AFTER BENDING AND DRILLING ASSEMBLY
PERFORM THE FOLLOWING:

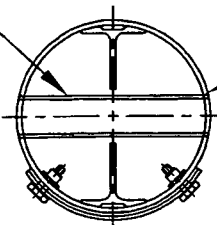
1. CHAMFER HOLE 0.030 x 45°
2. INSERT D2971 SPACER
3. WELD INTO PLACE AND GRIND FLUSH
4. PASS Ø0.750 DRILL TO REMOVE SPILL OVER
5. AFTER FINISH, INSTALL D3492-049 PLUG ASSEMBLY (2 PLACES)

SECTION E-E NOTES

AFTER BENDING AND DRILLING ASSEMBLY
PERFORM THE FOLLOWING:

1. CHAMFER HOLE 0.030 x 45°
2. INSERT D3662-3 SPACER
3. WELD INTO PLACE AND GRIND FLUSH
4. PASS Ø0.672 DRILL TO REMOVE SPILL OVER
5. AFTER FINISH, INSTALL D3492-051 PLUG ASSEMBLY (2 PLACES)

D2973 SPACER
(2 PLACES)



SECTION F-F
SCALE 3:10

SECTION F-F NOTES

AFTER BENDING AND DRILLING ASSEMBLY
PERFORM THE FOLLOWING:

1. CHAMFER HOLE 0.030 x 45°
2. INSERT D2973 SPACER (2 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. PASS Ø0.625 DRILL TO REMOVE SPILL OVER

D3584-1 WEB (REF)

D3662-1 SPACER
(3 PLACES)

AFTER FINISH, INSTALL
AELS-1032-130
INSERT (36 PLACES)

AN3C4A BOLT (1)
AN960C10L WASHER (1)
(28 PLACES)

SECTION G-G
SCALE 3:10

SECTION G-G NOTES

AFTER BENDING AND DRILLING ASSEMBLY
PERFORM THE FOLLOWING:

1. CHAMFER HOLE 0.030 x 45°
2. INSERT D3662-1 SPACER (3 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. PASS Ø0.515 DRILL TO REMOVE SPILL OVER
5. AFTER FINISH, INSTALL D3492-053 PLUG ASSEMBLY (6 PLACES)

AFTER FINISH, INSTALL
ALS7-428-165 INSERT (1)
AN4-4A BOLT (1)
AN960JD416L WASHER (1)
(2 PLACES)

AFTER FINISH
INSTALL,
D3492-053
PLUG ASSEMBLY
(6 PLACES)

DETAIL C

D3558-9
D3508-9

NO BOLTS AT
THESE LOCATIONS



D3558-3

D3558-11

D3508-3

D3508-11

D3558-13

D3508-13

NO BOLTS AT
THESE LOCATIONS



D3582-041 ASSEMBLY DETAIL

BLACK ANTI-SKID

8.0

16.2

58.4

16.0

5.0

0.8

BLACK ANTI-SKID (TYP)

D3582-041 BLACK ANTI-SKID DETAIL

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 44388A

SEAL WITH
SIKAFLEX -241/-291

D2965 CAP

D3584-1 WEB
(REF)



AN3-5A BOLT (1)
AN960JD10L WASHER (1)
(2 PLACES)

DETAIL H
SCALE 1:5

RELEASED
07.11.22

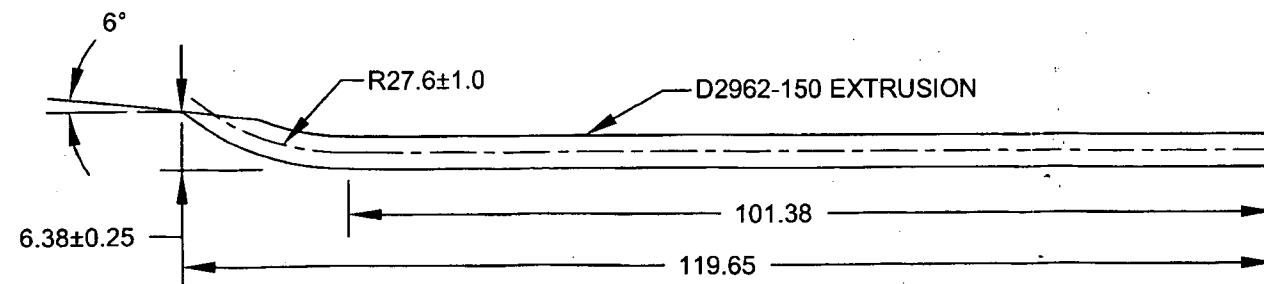
DESIGN	PH	DART AEROSPACE USA, INC	
DRAWN	PH	PORT HADLOCK, WA	
CHECKED	h	DRAWING NO.	REV. A
MFG. APPR.	h	D3582	SHEET 2 OF 2
APPROVED	h	TITLE	SCALE
DE APPR.	h	BK 117 SKIDTUBE ASSEMBLY	1:20
DATE	07.06.08	COPYRIGHT © 2007 BY DART AEROSPACE USA, INC	
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PARTS LIST FOR D3582-041 SKIDTUBE ASSEMBLY

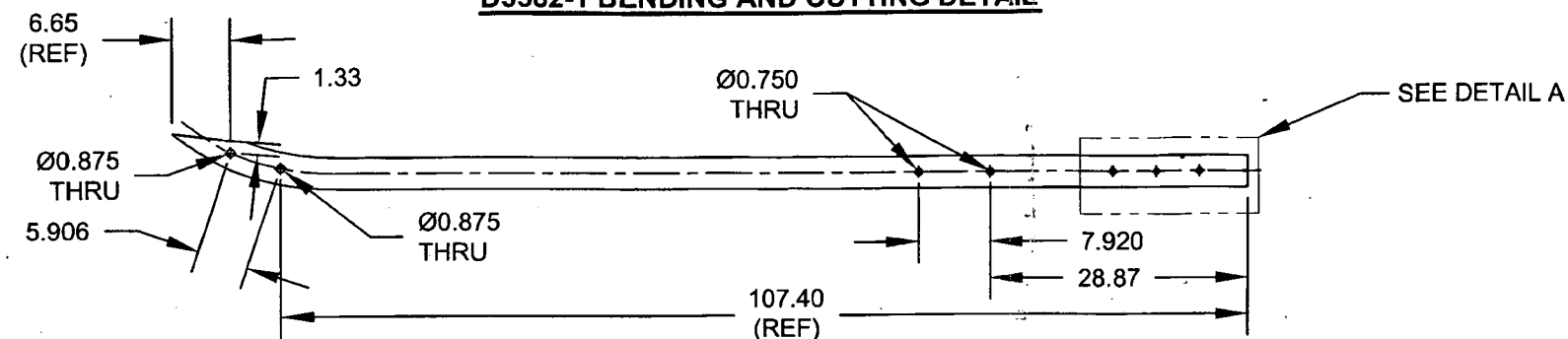
Qty	Part Number	Description
X	D3582-041	SKIDTUBE ASSEMBLY
1	D2962-150	EXTRUSION
1	D2964	CAP
1	D2965	CAP
1	D2971	CROSS BOLT SPACER
2	D2973	CROSS BOLT SPACER
2	D3492-049	PLUG ASSEMBLY
2	D3492-051	PLUG ASSEMBLY
6	D3492-053	PLUG ASSEMBLY
1	D3508-3	WEARPLATE
1	D3508-9	WEARPLATE
1	D3508-11	WEARPLATE
1	D3508-13	WEARPLATE
1	D3558-3	GASKET
1	D3558-9	GASKET
1	D3558-11	GASKET
1	D3558-13	GASKET
1	D3584-1	WEB
3	D3662-1	CROSS BOLT SPACER
1	D3662-3	CROSS BOLT SPACER
36	AELS-1032-130	INSERT
2	ALS7-428-165	INSERT
28	AN3C4A	BOLT
2	AN3-5A	BOLT
2	AN4-4A	BOLT
28	AN960C10L	WASHER
2	AN960JD10L	WASHER
2	AN960JD416L	WASHER

GENERAL NOTES:

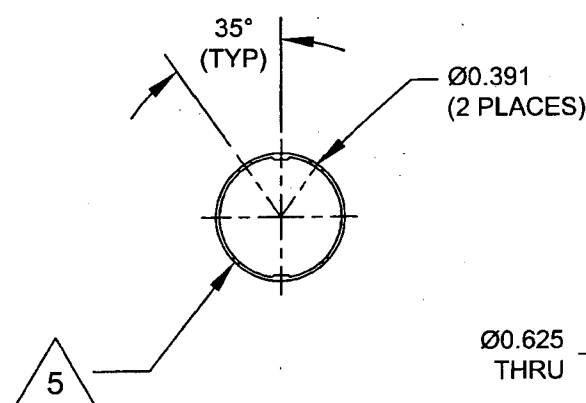
- ALL DIMENSIONS ARE IN INCHES
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- WELDING TO BE DONE PER DART QSI 004.
- INSERT D3584-1 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241/-291 ADHESIVE PER DART QSI 015 AFTER BENDING.
- USE DART DRILL TEMPLATE DT8900 TO LOCATE AND DRILL $\varnothing 0.297$ HOLES (36 PLACES) FOR WEARSHOE INSERTS. INSTALL AELS-1032-130 PER SECTION G-G (36 PLACES) AFTER FINISH. SEAL WEARPLATE BOLTS WITH SIKAFLEX-241/-291.
- DO NOT INSTALL AN3C4A BOLTS AND AN960C10L WASHERS IN INDICATED LOCATIONS.
- FINISH:
 - CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIOR TO INSERTING D3584-1 WEB.
 - POWDER COAT ASSEMBLY GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3.
 - ANTI-SKID PAINT AS INDICATED TO 1.00 ABOVE CENTER LINE PER DART QSI 005 4.4



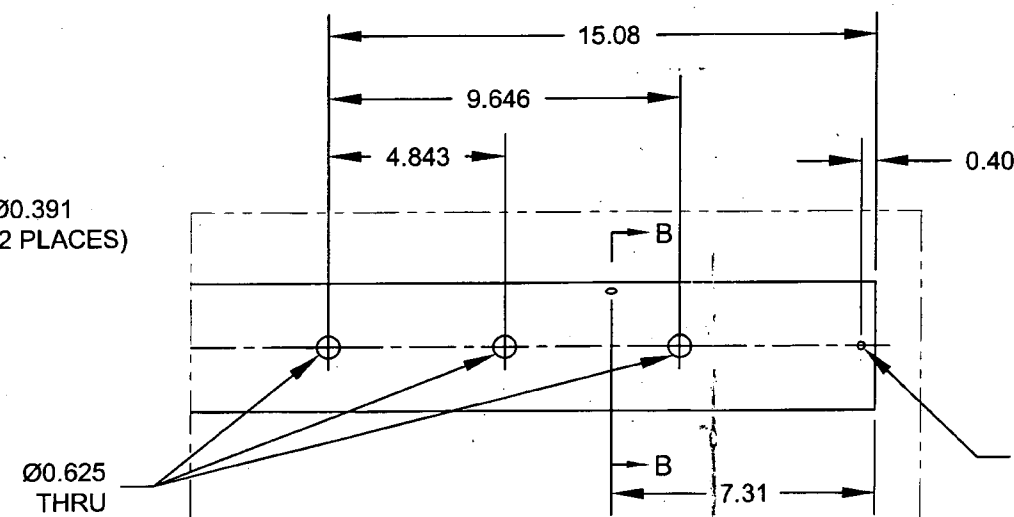
D3582-1 BENDING AND CUTTING DETAIL



D3582-1 DRILLING DETAIL



SECTION B-B
SCALE 1:5



DETAIL A
SCALE 1:5

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DESIGN	SA	DART AEROSPACE USA, INC PORT HADLOCK, WA	
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MFG. APPR.		D3582	SHEET 1 OF 2
APPROVED		TITLE	SCALE
DE APPR.		BK 117 SKIDTUBE ASSEMBLY	1:2
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